
THREE NEW SPECIES OF FERNS FROM MESOAMERICA

The following new species are described as part of my work on the pteridophyte volume for *Flora Mesoamericana*.

Tectaria acerifolia R. C. Moran, sp. nov. TYPE: Panama. Panamá: El Llano to Cartí road, 200 m, *Churchill & de Nevers 4200* (holotype, MO; isotypes, PMA, UC). Figure 1a, b.

Petiolus castaneus, laminam fere aequans. Lamina palmatiloba; soris seriebus 3–8 inter venas principales dispositis; indusiis reniformibus vel circularibus, haud peltatis.

Rhizome erect; sterile and fertile leaves dimorphic; petiole of sterile leaves ca. equaling the lamina, castaneous throughout, puberulent, scaly at base, the scales 1–2 mm long, 0.2–0.5 mm wide, lanceolate, spreading; lamina 14–29 cm long, palmately lobed; basal lobes or pinnae 12–18 cm long, falcate, entire but with 1–2 short basal basiscopic lobes; rachis and costae castaneous towards the base, tan distally, sparsely puberulent, the hairs ca. 0.1 mm long, inconspicuous; laminar tissue glabrous on both surfaces, drying dull green; petioles of the fertile leaves 2–3 times longer than the lamina; the fertile laminae 15–20 cm long; sori in 3–8 rows between the principal veins; indusia nonpeltate, attached laterally, reniform or circular.

Additional specimens examined. COSTA RICA. ALAJUELA. Upala, Bijagua El Pilón, de la intersección del camino San Miguel a El Pilón con el Río Chimurria, 600 m, *Herrera 2061* (MO). PANAMA. CANAL ZONE: Parque Nacional Soberanía, camino del Oleoducto, *Vasquez 239* (MO). COLÓN: 9–12 mi. E of Trans-Isthmian Hwy. on Santa Rita Ridge, 500–550 m, *Thompson 4850* (CM, MO). PANAMÁ: Cerro Jefe, 6 mi. past Cerro Azul on road to Altos Pacora, 800 m, *Sytsma & D'Arcy 3680* (MO); 5–9 mi. N of Pan-American Hwy. on El Llano–Cartí road, 200–250 m, *Thompson 4631* (CM). SAN BLAS: forest SE of Puerto Obaldia, *Croat 16842* (MO).

This species grows in wet forests at 200–800 m. It can be distinguished from all other tectarias in the New World by the combination of palmately divided leaves, dark axes, sori in 3–8 rows between the lateral veins, and fertile leaves with longer and more erect petioles than those of the sterile ones. It resembles *T. heracleifolia*, a species which differs by its peltate indusia, sori in 2–3 rows between the principal veins, stramineous axes, and usually 1-pinnate leaves.

Bolbitis simplex R. C. Moran, sp. nov. TYPE: Panama. Darién: Parque Nacional del Darién, ridge between N & S branches of Río Pucuro, in forest N of old village of Tacarcuna, ca. 18 km E of Pucuro, terrestrial on slopes along small stream, 600–800 m, *Hammel et al. 16467* (holotype, MO; isotypes, F, PMA, UC, US). Figure 1c, d.

Folia simplicia, integra, anguste oblanceolata ad anguste elliptica, apice gemma prolifera munita; venis areolas venulis inclusis formantibus; rhachidi dimidio proximali abaxialiter anguste alata.

Terrestrial; rhizome 4–6 mm wide, short-creeping, horizontal, scaly, the scales 2–4 × 0.5–1 mm, blackish, opaque; sterile and fertile leaves dimorphic; sterile lamina 23–50 cm long, 3.5–5 cm wide, simple, entire, narrowly oblanceolate to narrowly elliptic, cuneate, glabrous, with a subterminal bud; petiole 1–5 cm long, alate, scaly, the scales lanceolate, brown, spreading, nonclathrate; rachis with a narrow abaxial wing ca. 0.5 mm wide, best developed in the proximal half, parallel (not perpendicular) to the lamina; veins anastomosing, the areoles with recurrent free veinlets; fertile leaves 30–50 cm long, 0.7–1.1 cm wide, long-petiolate.

This new species resembles *Bolbitis pandurifolia* (Hook.) C. Chr. because both have simple leaves, subterminal buds, and areoles with included veinlets. The two species differ in several obvious characteristics of the sterile leaves. The petioles on sterile fronds of *B. simplex* are 1–5 cm long (about $\frac{1}{10}$ the length of the lamina), whereas those of *B. pandurifolia* are 16–27 cm long (about $\frac{1}{2}$ the length of the lamina). The sterile lamina of *B. simplex* is 3.5–5 cm wide, narrowly oblanceolate to narrowly elliptic, and cuneate basally, whereas that of *B. pandurifolia* is 6–12 cm wide, elliptic, oblong, or ternate with a single pair of basal pinnae, and short-decurrent, subcordate, or auriculate basally. The rachis of *B. simplex* has an abaxial, green, herbaceous wing, whereas that of *B. pandurifolia* lacks such a wing. Aside from morphology, the geography also differs: *B. simplex* is known from eastern Panama, whereas *B. pandurifolia* is known from central Ecuador to central Peru.

Salpichlaena thalassica Grayum & R. C. Moran, sp. nov. TYPE: Costa Rica. Heredia: forest

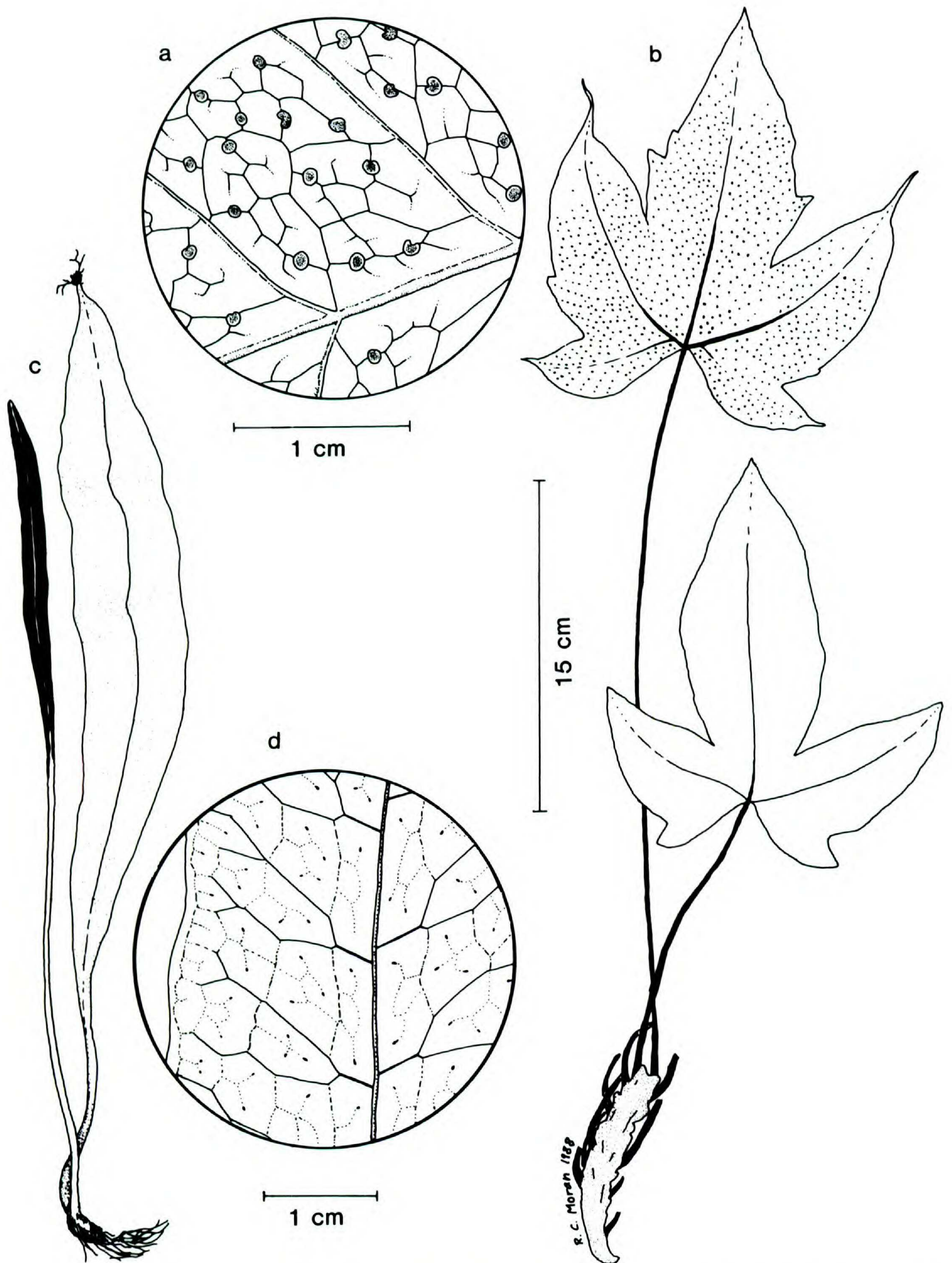


FIGURE 1. a, b. *Tectaria acerifolia* (Vásquez 239 MO).—a. Abaxial surface of fertile leaf.—b. Sterile and fertile leaves, note longer petiole of the fertile leaf.—c, d. *Bolbitis simplex* (Hammel et al. 16467 MO).—c. Sterile and fertile leaves.—d. Adaxial surface of the sterile leaf.

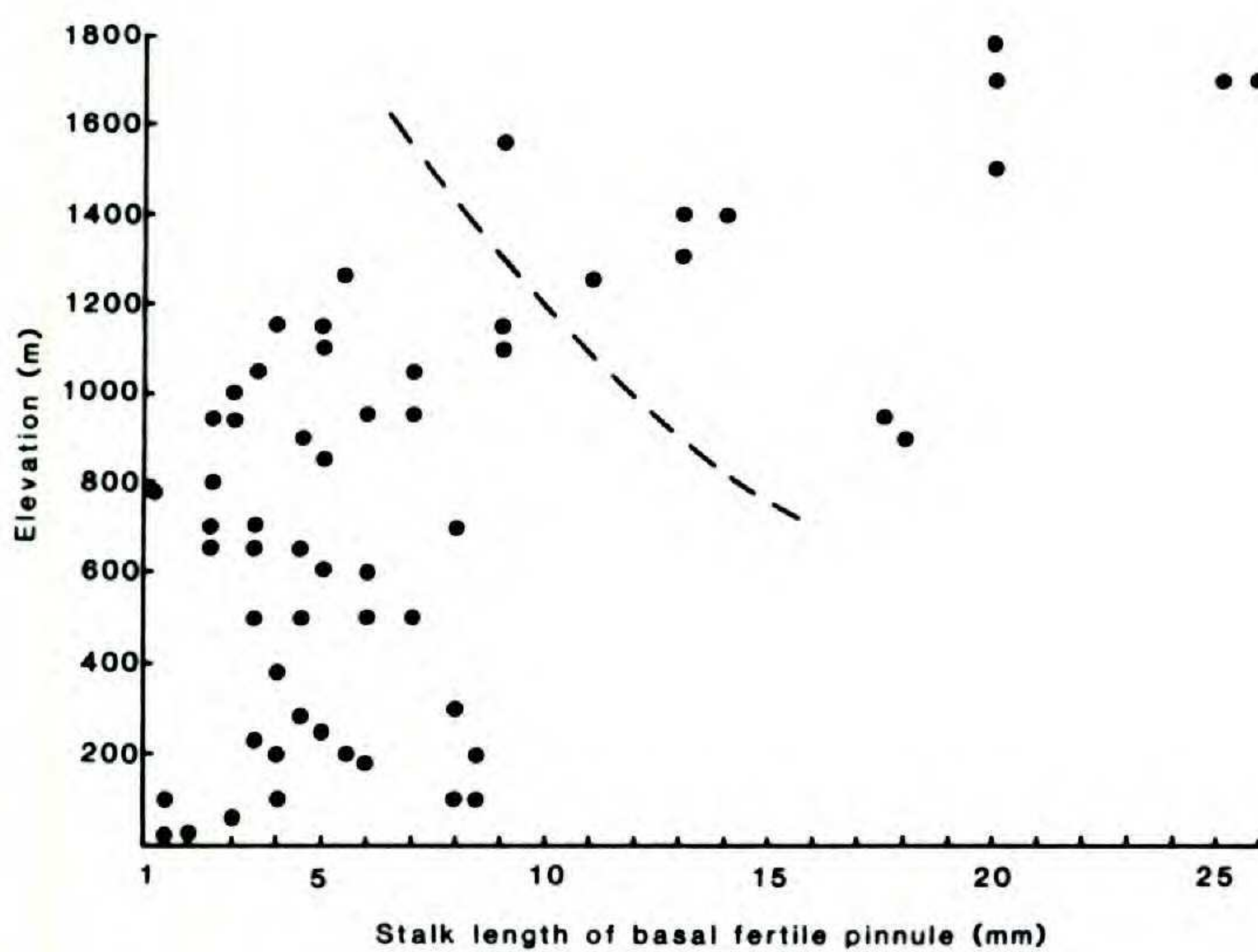


FIGURE 2. Elevation versus stalk length of the basal fertile pinnule in *Salpichlaena thalassica* (upper right; leaves blue-green) and *S. volubilis* (lower left; leaves dark green). Specimens measured were from Costa Rica and Panama.

between Río Peje and Río Sardinalito, Atlantic slope of Volcán Barva, 10°17'N, 84°4.5'W, 800–1,000 m, *Grayum & Chazdon 6833* (holotype, MO; isotype, CR).

Species haec ab *S. volubili* differt stipite longiore (9–26 mm) pinnulae basalis fertilis, foliis thalassicis, distributione altitudinali superiore.

Additional specimens examined. NICARAGUA. ZELAYA: Cerro La Pimienta, bosque enano, 1,000–1,200 m, *Grijalva 346* (CR); costado SW de Cerro El Hormiguero, 900–1,000 m, *Grijalva 470* (CR), *489* (CR); Cerro El Hormiguero, dense, virgin elfin forest, 1,100–1,183 m, *Pipoly 5187* (MO). COSTA RICA. CARTAGO: El Muñeco, S of Cartago, 1,350 m, *Stork 2711* (UC); Tapantí, Quebrada Segunda, *Berrocal & Sánchez 122* (CR), *123* (CR); Tapantí, 1,700 m, *Berrocal & Sánchez 122* (CR), *123* (CR); ca. 15 km S of Tapantí along the new road, on the E slope of the Río Grande de Orosi near the concrete bridge, 1,500 m, *Burger & Liesner 6807* (MO, NY, UC); mountains ca. 5 mi. S of Cartago, *Maxon 512* (NY). HEREDIA: Braulio Carillo National Park, 1,215 m, *Hennipman et al. 6893* (MO). PUNTARENAS: Monteverde, Veracruz River Valley S of reserve, 1,300–1,500 m, *Haber ex Bello & Clagett 5383* (MO). PANAMA. CHIRIQUÍ: trail W from Fortuna Dam Camp to La Fortuna, broad-leaved cloud forest, 1,300 m, *Hampshire & Whiteford*

370 (BM). DARIÉN: Mamey, ridge, 450 m, *Whiteford & Eddy 357* (CR); Cerro Mali base camp, Colombian border, 1,400 m, *Gentry & Mori 13754* (CR, MO). COLOMBIA. ANTIOQUIA: Mpio. Fontino, road to Murri, 15 km W of Nutibara (Altos de Cueva), 1,850 m, *Brant & Martínez 1386* (MO, UC). BOYACÁ: carretera Chinquirá a Pauna, 1,900 m, *Jaramillo et al. 3541* (MO). MAGDALENA: Sierra Nevada de Santa Marta, Cerro Ratón, Serranía de San Javier, 1,900 m, *Forero & Kirkbride 672* (MO). META: Sierra de la Macarena, Central Mts., N ridge, 1,500 m, *Philipson & Idrobo 1838* (BM). NARIÑO: Ricárte, 1,300 m, *von Sneider A.603* (MO); Reserva Natural La Planada, a 7 km de Chuncunés, 1,800 m, *de Benavides 9013* (MO).

This species was first noted by Dr. Michael Grayum, who observed that the leaves were blue-green rather than dark green, as in *S. volubilis*. His extensive fieldwork in Costa Rica has shown that the blue-green-leaved plants generally grow at higher elevations than *S. volubilis*, an observation supported by elevational data on herbarium specimens (Fig. 2). Further study of herbarium specimens found a quantitative character: the length of the stalk of the basal fertile pinnule was longer in the blue-green-leaved plant than in *S. volubilis* (Fig. 2). The lengths of the spores and characteristics of the stem scales were also checked, but these showed no differences with those of *S. volubilis*.

It was decided to recognize as a new species the plants with blue-green leaves because elevation and length of the basal fertile pinnule stalk correlated well, overlapping only slightly with those features of *S. volubilis*. Because of the overlap, it could be argued that *S. thalassica* is best treated as a subspecies or variety; however, Michael Grayum and I decided to treat it as a species to bring it to the forefront of pteridologists' attention.

I first noted that these species were undescribed while I was a National Science Foundation post-doctoral fellow for the *Flora Mesoamericana* project (BSR-8614880). I thank John Dwyer and Roy Gereau for checking the Latin descriptions.

—R. C. Moran, *Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166, U.S.A.*